EVER — CATCHER GROUP

WE CATCH THE BEST TECH. FOREVER

EVERBOUQUET INTERNATIONAL CO., LTD.

Midas Components Ltd - Web: www.midascomponents.co.uk
Tel: 0044 1493 602602 Fax: 0044 1493 665111

PART NO. : **MC1602C-SERIES**

FOR MESSRS. : ____________________

CONTENTS

洪
92.05.08
登正

ACCEPTED BY: ----------------- PROPOSED BY : -----------------

RECORD OF REVISION

DATE	PAGE	SUMMARY

3. General specifications

3.1 General specifications

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0069)".

3.2 This individual specification is prior to general specifications

3.3 NUMBERING SYSTEM

MC1602C	B	W	-	S	Y	M	L	O	U	N
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)

(1).CHARACTER FONTS：

PLEASE ERFER TO

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0069)"

(2).LCM TEMPERATURE：

"nil" ： NORMAL TEMP

"W" ： WIDE TEMP

(3).LCD TYPE：

"T" ： TN TYPE　　"S" ： STN TYPE

"H" ： HTN TYPE　　"F" ： FSTN TYPE

(4).LCD COLOR：

"Y" ： YELLOW-GREEN　　"B" ： BLUE(STN/NEGATIVE)/BLACK(FSTN/NEGATIVE)

"G" ： GRAY　　"W" ： WHITE(FSTN/POSITIVE)

(5)LCD POLARIZE TYPE

"nil" ： TRANSFLECTIVE

"M" ： TRANSMISSIVE

(6).BACKLIGHT TYPE：

"L" ： LED BACKLIGHT

"R" ： REFLECTIVE

(7).BACKLIGHT COLOR：

LED TYPE：

"nil" ： YELLOW-GREEN　　"A" ： AMBER　　"O" ： ORANGE

"R" ： RED

(8).VIEWING ANGLE：

"nil" ： 6 O'CLOCK　　"3" ： 3 O'CLOCK

"U" ： 12 O'CLOCK　　"9" ： 9 O'CLOCK

(9).BACKLIGHT TYPE：

"nil" ： LED(+),LED(-)---NORMAL

"N" ： LED(+),LED(-)---CHANGE

4. Mechanical data

(1) NUMBER OF DOT---------------------------------16 CH * 2 LINE

(2) MODULE SIZE -------------------------------------80.0 W *36.0 H * C T(max) mm

(3) EFFECTIVE AREA --------------------------------64.5 W * 16.0 H mm

(4) CHARACTER PATTERN -------------------------5 * 7 DOTS + CURSOR

(5) CHARACTER SIZE--------------------------------2.96W * 4.86 H mm

(6) CHARACTER PITCH -----------------------------3.55 mm

(7) DOT SIZE--0.56 W * 0.66 H mm

(8) DOT PITCH ---0.60W * 0.70H mm

NOTE：The dimension of "C"， please refer to Outline dimension on PAGE 8/9

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	$V_{DD}-V_{SS}$	0	6.0	V	-------
INPUT VOLTAGE	V_I	V_{SS}	V_{DD}	V	-------
STATIC ELECTRICITY	-------	------	100	V	NOTE (1)

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

5.2 Environmental absolute maximum ratings

ITEM	OPERATING			STORAGE		COMMENT
	CONDITION	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	NORMAL	0°C	50°C	-20°C	70°C	------
	WIDE	-20°C	70°C			
HUMIDITY	NOTE (3)			NOTE (3)		NO CONDENSATION
VIBRATION NOTE (4)	------	0.5G		------	2G	10~300Hz XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (4)	------	3G		------	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE			NOT ACCEPTABLE		------

NOTE (3): Ta ≦ 50°C: 90% RH MAX.

Ta ＞ 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90% RH AT 50°C. (80%RH AT 60°C)

NOTE (4): 1G = 9.8 m/s^2

6. *Electrical characteristics*

Ta = 25℃ *V_{DD} = 5.0±0.25 V*

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
INPUT VOLTAGE	V_{IH}	----------------		2.2	------	------	V
	V_{IL}			------	------	0.6	V
OUTPUT VOLTAGE	V_{OH}	$-I_{OH}$ =0.205 mA		2.4	------	------	V
	V_{OL}	I_{OL} = 1.2 mA		------	------	0.4	V
POWER SUPPLY CURRENT	I_{DD}	V_{DD} = 5.0V		------	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1)	$V_{DD}-V_O$	STN/ FSTN DUTY =1/16 Φ=10° NOTE(2)	Ta=-20°C	------	4.8	------	V
			Ta= 0°C	------	4.7	------	V
			Ta= 25°C	------	4.5	------	V
			Ta= 50°C	------	4.3	------	V
			Ta= 70°C	------	4.2	------	V
		TN DUTY =1/16 Φ=25° NOTE(2)	Ta=-20°C	------	4.7	------	V
			Ta= 0°C	------	4.6	------	V
			Ta= 25°C	------	4.2	------	V
			Ta= 50°C	------	3.8	------	V
			Ta= 70°C	------	3.7	------	V
POWER SUPPLY CURRENT FOR NOTE(3)	I_{LED}	V_{DD} =5.0 V		------	120	150	mA

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±0.5V BY EACH MODULE.

(2): θ = 0° : VIEWING ANGLE AT 6 O'CLOCK

θ = 180° : VIEWING ANGLE AT 12 O'CLOCK

7. Optical characteristics

TN TYPE LCD *Ta = 25 ℃ V_{DD}-V_O =4.2V*

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 1.4 NOTE(1)	20	30	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 25° NOTE(1)	2.0	3.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 25° NOTE(1)	----	150	250	ms	NOTE(2)
	tf (fall)	Φ = 25° NOTE(1)	----	150	250	ms	NOTE(2)

STN TYPE LCD *Ta = 25 ℃ V_{DD}-V_O =4.5V*

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

FSTN TYPE LCD *Ta = 25 ℃ V_{DD}-V_O =4.5V*

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	4.0	5.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

Brightness for backlight

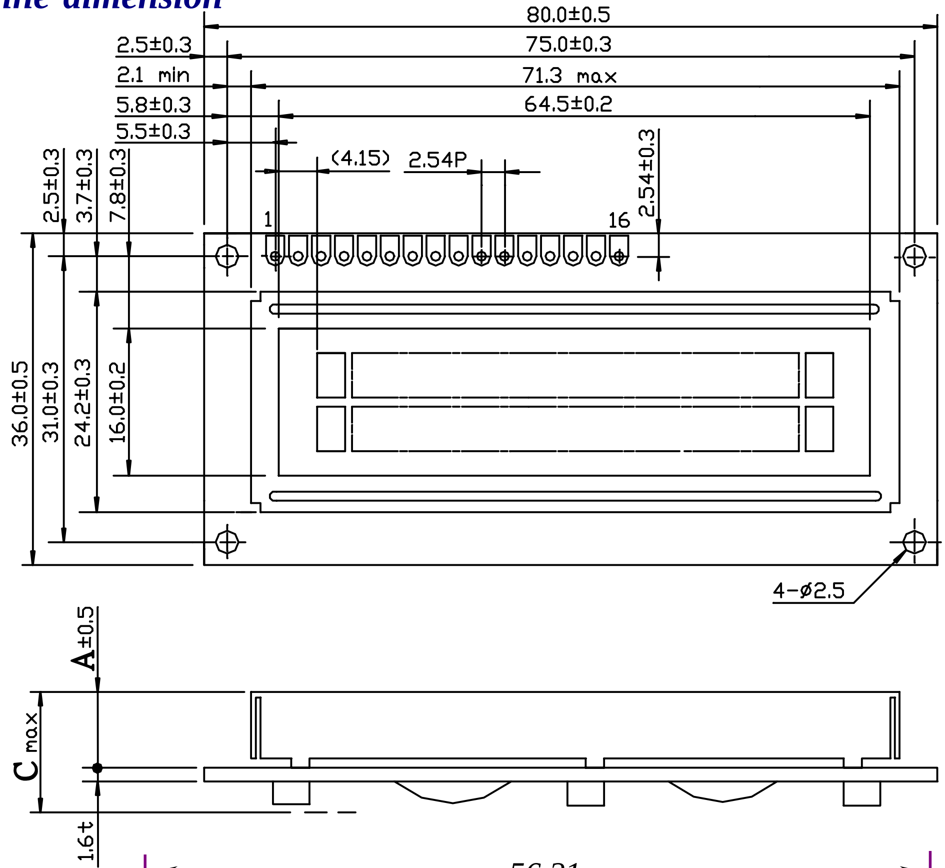
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
LED	B	Φ = 0° θ = 0°	5.0	----	----	cd/m^2	NOTE(2) NOTE(3)

NOTE (1): θ = 0° WHEN VIEWING ANGLE AT 6 O'CLOCK
θ = 180° WHEN VIEWING ANGLE AT 12 O'CLOCK

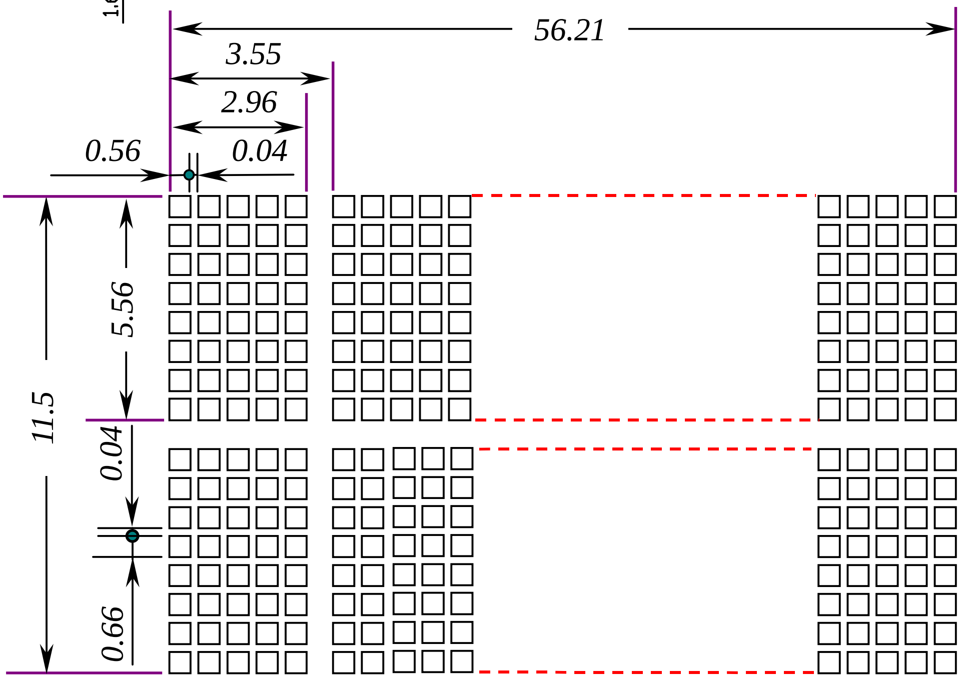
(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

(3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

8. Outline dimension



TYPE	A	C
LED BL	9.5	15.0
NO BL	4.9	10.0

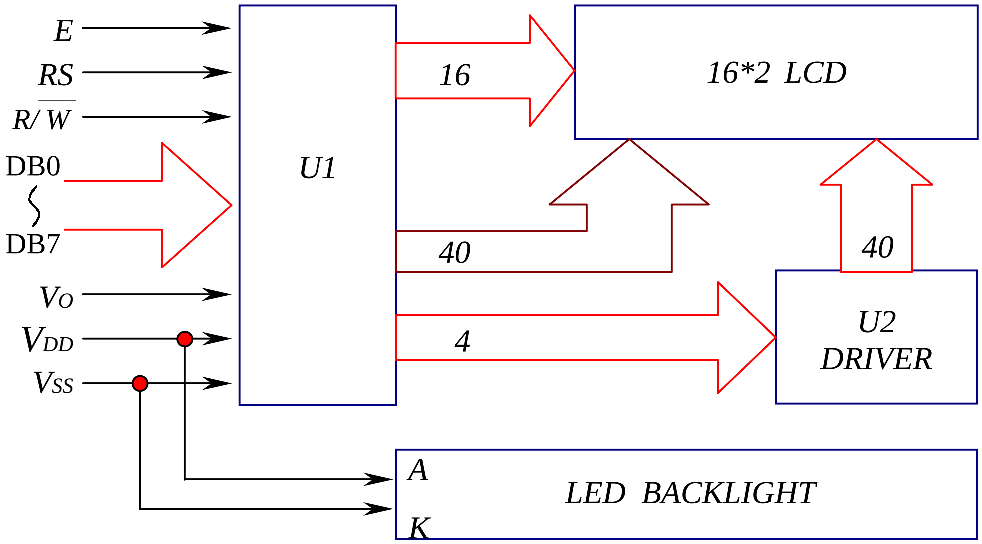


NOTE :
1.UNIT : mm
2.SCALE : NTS

Interface pin connection

PIN NO.	1	2	3	4	5	6	7	8
SYMBOL	VSS	VDD	VO	RS	R/$\overline{W}$	E	DB0	DB1
PIN NO.	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	NC	NC

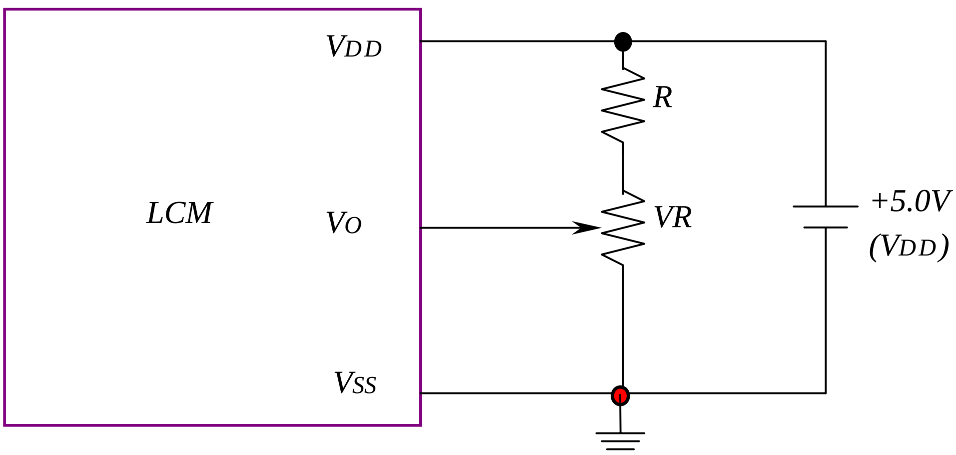
9. Block diagram



Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
LINE 2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F

10. Power supply for LCM



RECOMMENDED RESISTOR R : V_{DD}–V_O≧1.5V

V_{DD}–V_O: LCD DRIVING VOLTAGE

VR: 10KΩ~20KΩ